

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)	
)	
Request by Itron, Inc. for)	WT Docket No. 13-195
Waivers of the Commission's Rules)	

To: Chief, Wireless Telecommunications Bureau

PETITION FOR RECONSIDERATION OF ITRON, INC.

Itron, Inc. ("Itron"), pursuant to Section 1.106 of the Commission's rules, hereby petitions the Wireless Telecommunications Bureau ("Bureau") to reconsider the denial¹ of Itron's above-captioned request for waivers of Sections 22.355, 22.515, and 22.531 of the Commission's rules.²

In response to concerns expressed in the *Waiver Denial*, in this Petition Itron addresses the requirements for protecting co-channel licensees in the 931 MHz band. In particular, Itron clarifies elements of its prior showing as to how it will meet or exceed the co-channel protection requirements of Sections 22.503 and 22.537 of the Commission's rules.³ In light of this showing, Itron's *Waiver Request* is consistent with

¹ Letter from Roger S. Noel, Chief, Mobility Division, Wireless Telecommunications Bureau, FCC, to Ms. Laura Stefani and Mr. Joseph A. Godles, Goldberg, Godles, Wiener & Wright LLP, DA 15-42 (Jan. 13, 2015) ("*Waiver Denial*").

² Itron, Inc. Request for Waiver, WT Docket No. 13-195, filed Dec. 17, 2012 ("*Waiver Request*").

³ Itron is not presenting new facts or arguments in this Petition; it only is clarifying the manner in which it will protect co-channel licensees. In any event, consideration of the facts and arguments presented in this Petition is appropriate because it is in the public interest. See 47 C.F.R. § 1.106(c)(2).

the underlying purpose of the rules. Accordingly, and given the public interest benefits that will result, the Bureau should, on reconsideration, grant Itron's *Waiver Request*.

I. BACKGROUND AND INTRODUCTION

In December 2012, Itron requested waivers of various rules pertaining to its operations associated with licenses it holds in the 931 MHz band. Itron requested waivers of Sections 22.515 and 22.531, to the extent necessary, to allow it to engage in half-duplex transmissions to facilitate transmissions both to and from Itron's meter module end points. Itron also requested a waiver of Section 22.355 to permit its fixed and mobile stations that operate with an effective radiated power ("ERP") of less than 2 watts to be subject to a frequency tolerance of 5 ppm rather than 1.5 ppm. Grant of these waivers would enable Itron to support automatic meter reading ("AMR") and advanced metering infrastructure ("AMI") systems that are key components of modern smart grid infrastructure.

As stated in the *Waiver Request*, Itron's system architecture consists of: (1) fixed and mobile readers that generally operate with an ERP of 40 watts or less, and that will always operate with an ERP of 100 watts or less, and (2) customer-premises end points ("EPs") that are located on utility meters and that will transmit to the readers at a very low power of between 0.5 to 2 watts ERP.⁴ Because these power levels are well below the maximum power that is permitted under the 931 MHz paging rules, Itron explained that the risk for interference to co-channel users of the 931 MHz band will be no more

⁴ *Waiver Request* at 3-4.

than — and in most cases, far less than — the risk of interference from other licensed one-way paging systems.⁵ Itron also explained that even with a frequency tolerance of 5 ppm rather than 1.5 ppm, its low-power, battery-powered EPs would afford as much or more protection to adjacent channels as devices that satisfy the 1.5 ppm standard.⁶

Only one party, USA Mobility, objected to Itron's *Waiver Request*.⁷ USA Mobility argued that the flexibility sought by Itron in its waiver request should only be granted following a rulemaking proceeding, and also claimed that Itron's proposed operations would present a risk of interference to its paging systems. Itron addressed USA Mobility's comments by responding in detail to its arguments concerning interference and explaining that Itron's operations would present no greater interference risk than a traditional one-way paging system.⁸

On January 13, 2015, the Bureau denied Itron's *Waiver Request*. The Bureau found that Itron had not adequately explained how its proposed operations will protect co-channel site-based incumbents and co-channel geographic area licensees as required by Section 22.503.⁹ Based on this finding, the Bureau concluded Itron had not demonstrated that a waiver would be consistent with the underlying purpose of the rules — *i.e.*, to provide interference protection to co-channel licensees — as required by

⁵ *Id.* at 5-7.

⁶ *Id.* at 9-11.

⁷ Comments of USA Mobility, Inc., WT Docket No. 13-195 (filed Sep. 9, 2013) ("*USA Mobility Comments*").

⁸ Reply of Itron, Inc., WT Docket No. 13-195, at 11-15 (filed Sep. 24, 2013).

⁹ *Waiver Denial* at 5.

Section 1.925 of the rules.¹⁰ For similar reasons, the Bureau also concluded that Itron had not established “good cause” for a waiver pursuant to Section 1.3 of the rules.¹¹

In this Petition, Itron clarifies how it will protect co-channel site-based incumbents and geographic area licensees. In light of this clarification, the Bureau should reconsider its *Waiver Denial* and grant Itron’s request for waiver of Sections 22.355, 22.515, and 22.531 of the Commission’s rules.

Itron also notes its willingness to address USA Mobility’s interference concerns. To that end, it has requested a meeting with USA Mobility, and the parties are making arrangements for a meeting.

II. ITRON’S PROPOSED SYSTEM WILL PROTECT CO-CHANNEL SITE-BASED INCUMBENTS AND CO-CHANNEL GEOGRAPHIC AREA LICENSEES FROM HARMFUL INTERFERENCE

The attached Technical Statement prepared by Chris Osterloh (“Osterloh Statement”), Itron’s Systems Engineering Advisor, clarifies the manner in which Itron will protect co-channel 931 MHz stations.

As stated by Mr. Osterloh, Itron’s fixed and mobile readers, which serve as base stations, will observe the co-channel protection requirements for 931 MHz paging system base stations as set forth in Sections 22.537 and 22.503 of the rules.¹² So if the interfering contour of one of Itron’s readers overlaps with the service contour of a co-channel base station in an adjacent market, then Itron will coordinate with the adjacent

¹⁰ *Id.*

¹¹ *Id.*

¹² Osterloh Statement at 2.

market licensee in accordance with the requirements of Section 22. 503(h) of the rules.¹³

And Itron will comply with Section 22.503(i) of the rules by applying this interfering contour/service contour methodology for its reader stations to protect co-channel site-based incumbent licensees.¹⁴

Itron's equipment design ensures that its mobile readers, like its fixed readers, will be capable of satisfying these requirements. As stated in the Osterloh Statement, Itron's mobile readers "have GPS functionality that enables Itron to program protection zones for them to observe based on interfering contour/service contour overlaps and the terms of coordination agreements Itron enters into with the licensees of co-channel stations."¹⁵

Itron's EPs will provide the same levels of protection as its readers. As stated by Mr. Osterloh, if the interfering contour of an EP overlaps with the service contour of a co-channel base station in an adjacent market, then Itron will coordinate with the licensee of the co-channel base station in accordance with the requirements of Section 22. 503(h) of the rules.¹⁶ And consistent with Section 22.503(i) of the rules, Itron will employ this interfering contour/service contour methodology for its EPs to protect co-channel site-based incumbent licensees.¹⁷ Given the extremely low power levels at

¹³ *Id.*

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ *Id.* at 3.

¹⁷ *Id.*

which Itron's EPs will operate, however, the EPs' interfering contours rarely, if ever, will overlap with the service contour of a co-channel station.

Mr. Osterloh also shows how in practice "Itron's readers and EPs will be more protective of co-channel stations than a maximum-facility base station in a traditional one-way paging system."¹⁸ The readers and EPs "will operate with significantly lower effective radiated power than the maximum effective radiated power that the rules permit."¹⁹ They also "will have significantly lower duty cycles than the rules permit."²⁰ And "[b]ecause paging receivers are optimized to receive a specific protocol generally used in paging systems, they are, all things being equal, more susceptible to interference from a paging base station utilizing the same protocol than they are to interference from an Itron station."²¹

For these reasons, Itron's readers and EPs will provide as much or more co-channel protection than the rules require.

¹⁸ *Id.* at 4.

¹⁹ *Id.*

²⁰ *Id.*

²¹ *Id.*

III. ITRON'S PROPOSED OPERATIONS ARE CONSISTENT WITH THE UNDERLYING PURPOSE OF THE RULES AND WILL FURTHER THE PUBLIC INTEREST BY ENABLING MORE EFFECTIVE AND EFFICIENT SMART GRID OPERATIONS

Waiver of the Commission's rules is warranted when the underlying purpose of the Commission's rules would not be frustrated and grant of the waiver is in the public interest.²² Waiver of the Commission's rules is also warranted for "good cause" shown.²³ Itron satisfies both of these standards.

In denying Itron's *Waiver Request*, the Bureau concluded that Itron had not adequately demonstrated that its operations would be consistent with the underlying purpose of the rules, *i.e.*, to protect co-channel 931 MHz licensees. As clarified above, however, Itron's proposed operations would provide as much or more co-channel protection as is required under the rules. Accordingly, granting a waiver would not frustrate the underlying purpose of the rules.

Grant of a waiver also would serve the public interest, which furnishes good cause for a waiver. The public interest benefits of a waiver, as identified in the *Waiver Request*, have not been disputed. Grant of the *Waiver Request* will enable Itron to meet the growing needs of utilities for smart grid capabilities. The AMR and AMI services that Itron intends to provide will make utility operations safer, because they will make data available to utilities in real time and provide a real-time link between the utility

²² 47 C.F.R. § 1.925(b)(3)(i).

²³ 47 C.F.R. § 1.3.

and the customer's meter. Having a real-time connection can be of significant benefit in identifying and resolving safety-related issues.

The Commission has classified AMR and AMI operations as “Critical Infrastructure Industries,”²⁴ and AMI has become vital to enhancements being made to the nation’s electrical and gas distribution infrastructure and to the application of smart grid technology. The waivers Itron has requested are in the public interest because they would promote the effective and efficient operation of the grid, consistent with fulfilling our nation’s need to manage distribution of electricity, water and gas in a manner that maximizes efficiency and supports effective responses in critical situations.

²⁴ See *Improving Public Safety Communications in the 800 MHz Band*; WT Docket No. 02-55, Notice of Proposed Rulemaking, 17 FCC Rcd 4873, 4894 at ¶ 36, n.96 (2002).

CONCLUSION

For the reasons discussed above and for good cause shown, the Bureau should reconsider its earlier denial and grant Itron's request for waiver of Sections 22.355, 22.515, and 22.531 of the Commission's rules.

Respectfully submitted,

ITRON, INC.

By: /s/ Joseph A. Godles
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February 12, 2015

Technical Statement of Chris Osterloh In Support of Itron's Petition for Reconsideration

This Technical Statement has been prepared in support of Itron's Petition for Reconsideration of the denial of Itron's request for waivers of Section 22.355, 22.515, and 22.531 of the Commission's Rules (the "Waiver Denial"). In the Waiver Denial, the Wireless Telecommunications Bureau found it unclear how Itron will protect co-channel site-based incumbents and co-channel geographic area licensees from harmful interference, as required by Section 22.503 of the Commission's rules. Itron clarifies in this Technical Statement the means by which it will provide the interference protection to co-channel site-based incumbents and co-channel geographic area licensees that is required by Section 22.503. Itron also shows how in practice it will provide greater interference protection to these incumbents and licensees than would be provided by maximum-facility paging system base stations.

Qualifications of Mr. Osterloh

Chris Osterloh is a Systems Engineering Advisor at Itron, where he is responsible for end-to-end system architecture, performance analyses, and security design for multiple AMI/AMR/Telemetry systems. He has performed extensive modeling of system capacity, network redundancy, and RF coverage on domestic and international solutions. Mr. Osterloh has a Masters degree in electrical engineering from the University of Missouri at Rolla, where he was both a research assistant and a graduate teaching assistant. He is a holder of 15 US patents and has published multiple articles on RF system design and optimization. Mr. Osterloh is active in the Standards approval process within the IEEE and the System Security working group in INCOSE. He is also an active member of the FBI's InfraGard association and belongs to the Electricity, Water and ONG sectors of the Homeland Security Information Network as well as a private sector member of ICEFISHX/Minnesota Joint Analysis Center.

Interference Protection Clarifications

The channels that are the subject of Itron's waiver request are one-way 931 MHz band paging channels that are licensed under Part 22 of the Commission's rules. One-way 931 MHz paging systems consist of base station transmitters and remote (paging) station receivers.

Because the only transmitting stations in a traditional one-way 931 MHz paging system are base stations, the interference protection requirements for one-way paging systems are expressed in Part 22 in terms of limits on base station transmitters. Section 22.537(f) includes a table for determining the radius of the interfering contour of a base station. The table provides a sliding scale for radii that varies with the height above average terrain of the base station and

the effective radiated power of the base station. If the interfering contour of a base station overlaps with the service contour of a co-channel base station in an adjacent market, based on the service contour radius table shown in Section 22.537(e) of the rules, then the licensee of the interfering contour station must coordinate with the licensee of the service contour station in accordance with the requirements of Section 22. 503(h) of the rules. And Section 22.503(i) of the rules requires that this same interfering contour/service contour methodology be used to protect co-channel site-based incumbent licensees.

Itron's system architecture differs from that of one-way 931 MHz paging systems and includes transmitting stations that are not traditional base stations. Itron's network consists of customer-premises endpoints ("EPs") that are located on utility meters and "readers" that are used to collect information from EPs and relay information to EPs. There are three types of readers: fixed, pole-mounted devices known as cell control units or "CCUs"; vehicle driven mobile devices known as mobile collectors or "MCs"; and hand held mobile devices known as "HHs." For each transmission path, Itron's system will, at any given point in time, transmit messages in one direction only, either from a reader (*i.e.*, a CCU, MC, or HH) to an EP or repeater, or from an EP or repeater to a reader.

The readers in Itron's network function as base stations. Accordingly, the co-channel protection requirements of Sections 22.537(e), 22.537(f), 22. 503(h), and 22. 503(i) of the rules apply to Itron's readers, and Itron's readers will comply with these provisions. For co-channel interference protection purposes, therefore, Itron's readers are indistinguishable from base stations in traditional one-way 931 MHz paging systems. For these reasons, no waiver of Sections 22.537(e), 22.537(f), 22. 503(h), and 22. 503(i) should be needed for Itron's readers. Even if a waiver were required, there should be no interference protection-related impediment to granting one, because co-channel stations will be protected to the extent the rules envision.

Itron's mobile readers will comply with the co-channel protection requirements of Sections 22.537(e), 22.537(f), 22. 503(h), and 22. 503(i) of the rules to the same extent as its fixed-station CCUs. Itron's vehicle driven mobile collectors and its hand-held mobile readers all have GPS functionality that enables Itron to program protection zones for them to observe based on interfering contour/service contour overlaps and the terms of coordination agreements Itron enters into with the licensees of co-channel stations.

The EPs in Itron's network do not function as base stations. Accordingly, the co-channel protection requirements of Sections 22.537(e), 22.537(f), 22. 503(h), and 22. 503(i) of the rules do not by their terms apply to Itron's EPs. Those rule provisions were written with traditional

one-way 931 MHz paging systems in mind, so there was no reason address co-channel protection requirements for any types of stations other than base stations.

Although the co-channel protection requirements of Sections 22.537(e), 22.537(f), 22.503(h), and 22.503(i) of the rules do not by their terms apply to Itron's EPs, the EPs are indistinguishable for co-channel interference protection purposes from base stations in traditional one-way 931 MHz paging systems. The potential for co-channel interference from an EP, like the potential for interference from a paging base station, depends on the height above average terrain of the base station; the effective radiation power of the base station; and the relationship between the EP's interfering contour, as calculated in accordance with Section 22.537(f) of the rules, and the service contour of the co-channel station, as calculated in accordance with Section 22.537(e) of the rules.

For example, a 931 MHz paging system base station that has an antenna height above average terrain of between zero and 580 feet and an effective radiated power of between zero and 125 watts will, based on the table in Section 22.537(f), produce an interfering contour with a 50-mile radius. An EP in Itron's system that has an antenna height above average terrain of between zero and 580 feet and an effective radiated power of between zero and 125 watts also will produce an interfering contour with a 50-mile radius. Similarly, the service contour of a co-channel station will be the same regardless of whether the interfering contour is produced by a 931 MHz paging system base station or an Itron EP. A paging receiver is not affected by whether a signal emanates from a base station transmitter or an EP transmitter. It only is affected by the technical characteristics of the signal.

So long as Itron's EPs follow the requirements of Sections 22.503 and 22.537 of the rules, therefore, co-channel stations will be protected to the same extent as they are protected under the rules against interference from base stations. It has always been Itron's intention that its EPs will comply with the requirements of Sections 22.503 and 22.537 of the rules. If the interfering contour of an EP overlaps with the service contour of a co-channel base station in an adjacent market, then Itron will coordinate with the licensee of the co-channel base station in accordance with the requirements of Section 22.503(h) of the rules. And consistent with Section 22.503(i) of the rules, Itron will employ this same interfering contour/service contour methodology to protect co-channel site-based incumbent licensees. (Only one of Itron's 155 MEAs has a co-channel site-based incumbent licensee). Given that Itron's EPs will provide as much co-channel interference protection as base stations in traditional one-way 931 MHz paging systems, there should be no interference protection-related impediment to waiving the rules to permit Itron to operate EPs.

For multiple reasons, moreover, in practice Itron's readers and EPs will be more protective of co-channel stations than a maximum-facility base station in a traditional one-way paging system.

First, Itron's stations will operate with significantly lower effective radiated power than the maximum effective radiated power that the rules permit. Under the rules, a base station may operate with an effective radiated power of up to 3,500 watts. Itron's readers generally will have an effective radiated power of 40 watts or less, and they always will have an effective radiated power of 100 watts or less. The effective radiated power for the battery-powered EPs will be 0.5 to 2 watts.

Second, Itron's stations will have significantly lower duty cycles than the rules permit. Under the rules, a base station in a traditional one-way 931 MHz paging system may have a 100 percent duty cycle, and most paging systems have duty cycles that are at high levels. Itron's EPs, on the other hand, will have an expected duty cycle that is 0.1%. Itron readers will always have a duty cycle less than 50% and typically less than 10%.

Finally, Itron's stations operate with different signal composition than paging stations. Paging receivers in North America are designed and optimized for operating with one of a handful of specific protocols: 2-tone, 5/6-tone, GOLAY, POCSAG, and the FLEX/ReFLEX family. Tone based pagers are designed to respond to a set of analog tones, GOLAY pagers operate at 300 or 600 baud, and POCSAG pagers use 512, 1200 or 2400 baud. Pagers supporting the FLEX/ReFLEX family of protocols are optimized to receive transmissions at 1600 or 3200 symbols per second with a fixed 1.875 second frame rate. Itron's stations, on the other hand, will utilize different data rates and frame timings than the standard paging protocols. Because paging receivers are optimized to receive a specific protocol generally used in paging systems, they are, all things being equal, more susceptible to interference from a paging base station utilizing the same protocol than they are to interference from an Itron station.

Conclusion

As the above statement demonstrates, Itron's system will provide interference protection to co-channel site-based incumbents and operators in adjacent MEAs that is as good as or better than the protection levels that are provided for in the rules.

I hereby certify that I am a technically qualified person responsible for the preparation of engineering information contained in this filing, that I am familiar with Part 22 of the Commission's rules, that I have prepared or reviewed the engineering information submitted in this Technical Statement and the associated discussion in the Petition for Reconsideration which it supports, and that they are complete and accurate to the best of my knowledge.

By: /s/ Chris Osterloh
Chris Osterloh
Systems Engineering Advisor
Itron, Inc.

February 12, 2015

CERTIFICATE OF SERVICE

I hereby certify that on this 12th day of February, 2015, a copy of the foregoing Petition for Reconsideration of Itron, Inc. was sent by U.S. mail, postage prepaid, to the following:

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